

## 74F521 8-Bit Identity Comparator

### General Description

The 74F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input  $I_{A=B}$  also serves as an active LOW enable input.

### Features

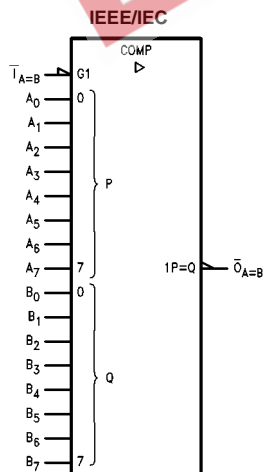
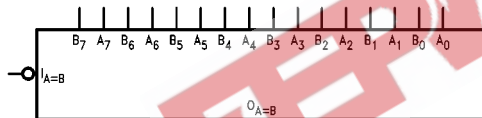
- Compares two 8-bit words in 6.5 ns typ
- Expandable to any word length
- 20-pin package

### Ordering Code:

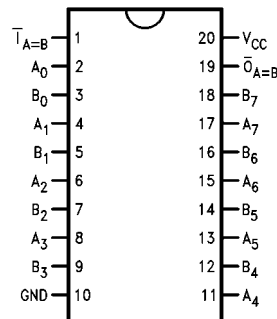
Order Number	Package Number	Package Description
74F521SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
74F521SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F521MSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide
74F521PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

### Logic Symbols



### Connection Diagram



## Unit Loading/Fan Out

Pin Names	Description	U.L.	Input $I_{IH}/I_{IL}$
		HIGH/LOW	Output $I_{OH}/I_{OL}$
$A_0$ – $A_7$	Word A Inputs	1.0/1.0	20 $\mu$ A/–0.6 mA
$B_0$ – $B_7$	Word B Inputs	1.0/1.0	20 $\mu$ A/–0.6 mA
$\bar{I}_{A=B}$	Expansion or Enable Input (Active LOW)	1.0/1.0	20 $\mu$ A/–0.6 mA
$\bar{O}_{A=B}$	Identity Output (Active LOW)	50/33.3	–1 mA/20 mA

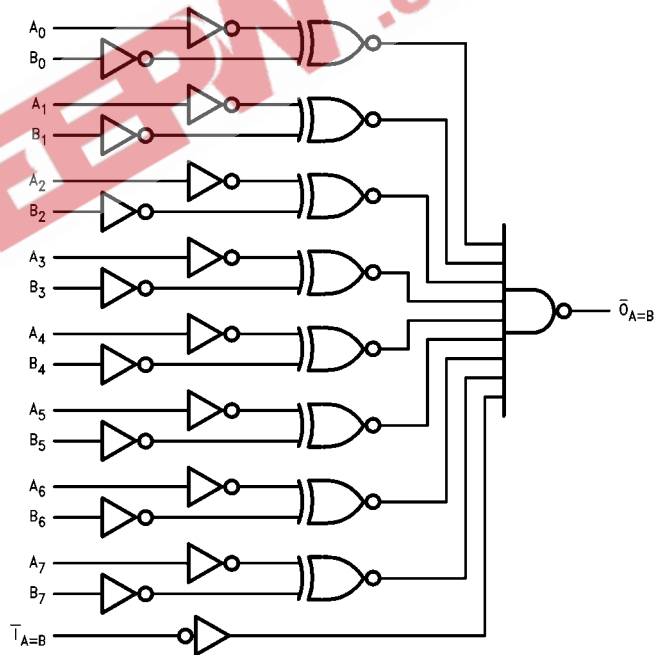
## Truth Table

Inputs		Output
$\bar{I}_{A=B}$	A, B	$\bar{O}_{A=B}$
L	A = B (Note 1)	L
L	A $\neq$ B	H
H	A = B (Note 1)	H
H	A $\neq$ B	H

H = HIGH Voltage Level  
L = LOW Voltage Level

Note 1:  $A_0 = B_0$ ,  $A_1 = B_1$ ,  $A_2 = B_2$ , etc.

## Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

**Absolute Maximum Ratings** (Note 2)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	-55°C to +150°C
V <sub>CC</sub> Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 3)	-0.5V to +7.0V
Input Current (Note 3)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with V <sub>CC</sub> = 0V)	
Standard Output	-0.5V to V <sub>CC</sub>
3-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated I <sub>OL</sub> (mA)

**Recommended Operating Conditions**

Free Air Ambient Temperature	0°C to +70°C
Supply Voltage	+4.5V to +5.5V

**Note 2:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Note 3:** Either voltage limit or current limit is sufficient to protect inputs.

**DC Electrical Characteristics**

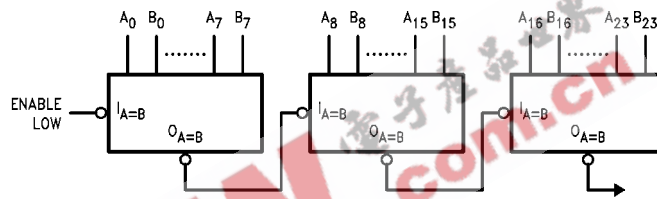
Symbol	Parameter	Min	Typ	Max	Units	V <sub>CC</sub>	Conditions
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V <sub>IL</sub>	Input LOW Voltage			0.8	V		Recognized as a LOW Signal
V <sub>CD</sub>	Input Clamp Diode Voltage			-1.2	V	Min	I <sub>IN</sub> = -18 mA
V <sub>OH</sub>	Output HIGH Voltage	10% V <sub>CC</sub>	2.5		V	Min	I <sub>OH</sub> = -1 mA
		5% V <sub>CC</sub>	2.7				I <sub>OH</sub> = -1 mA
V <sub>OL</sub>	Output LOW Voltage	10% V <sub>CC</sub>		0.5	V	Min	I <sub>OL</sub> = 20 mA
I <sub>IH</sub>	Input HIGH Current			5.0	μA	Max	V <sub>IN</sub> = 2.7V
I <sub>BVI</sub>	Input HIGH Current Breakdown Test			7.0	μA	Max	V <sub>IN</sub> = 7.0V
I <sub>CEX</sub>	Output HIGH Leakage Current			50	μA	Max	V <sub>OUT</sub> = V <sub>CC</sub>
V <sub>ID</sub>	Input Leakage Test	4.75			V	0.0	I <sub>ID</sub> = 1.9 μA All Other Pins Grounded
I <sub>OD</sub>	Output Leakage Circuit Current			3.75	μA	0.0	V <sub>IOD</sub> = 150 mV All Other Pins Grounded
I <sub>IL</sub>	Input LOW Current			-0.6	mA	Max	V <sub>IN</sub> = 0.5V
I <sub>OS</sub>	Output Short-Circuit Current	-60		-150	mA	Max	V <sub>OUT</sub> = 0V
I <sub>CCH</sub>	Power Supply Current		21	32	mA	Max	V <sub>O</sub> = HIGH

## AC Electrical Characteristics

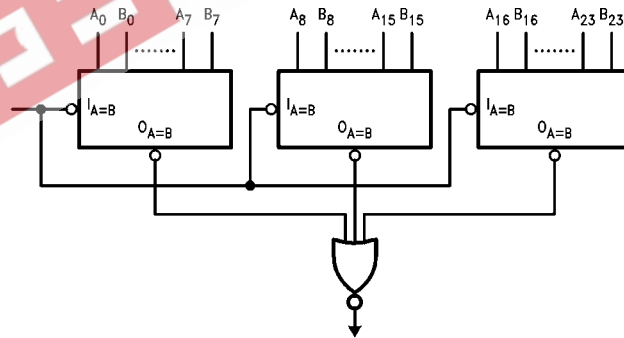
Symbol	Parameter	$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$		$T_A = 0^\circ\text{C to } +70^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$		Units
		Min	Typ	Max	Min	Max	Min	Max	
$t_{PLH}$	Propagation Delay	3.0	7.0	10.0	3.0	14.0	3.0	11.0	ns
$t_{PHL}$	$A_n$ or $B_n$ to $\overline{O}_{A=B}$	4.5	7.0	10.0	4.0	15.0	4.0	11.0	
$t_{PLH}$	Propagation Delay	3.0	5.0	6.5	3.0	8.5	3.0	7.5	ns
$t_{PHL}$	$\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	3.5	6.5	9.0	3.5	13.5	3.5	10.0	

## Applications

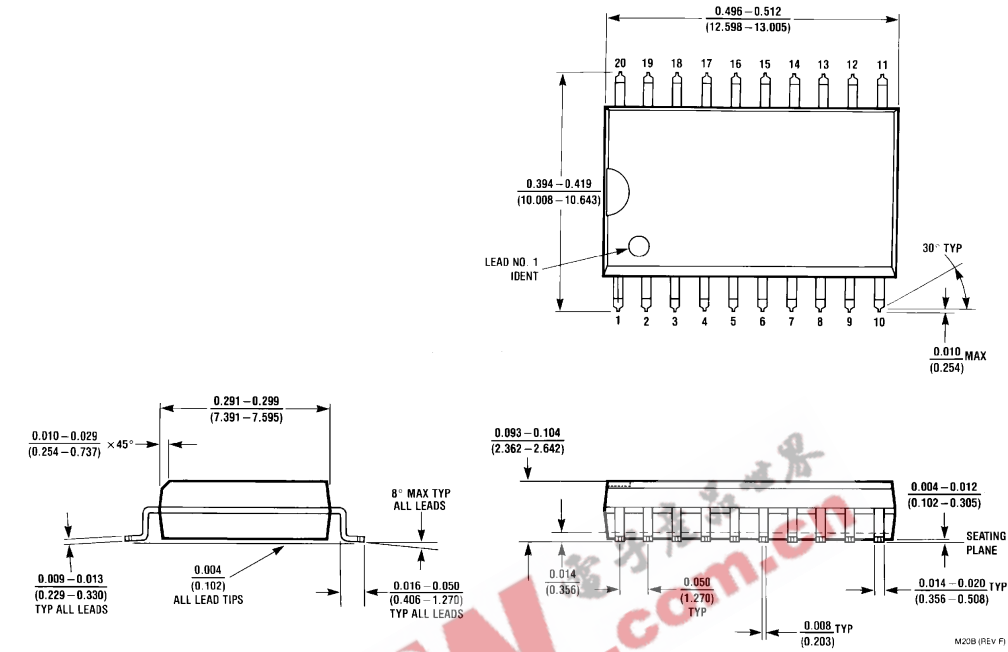
### Ripple Expansion



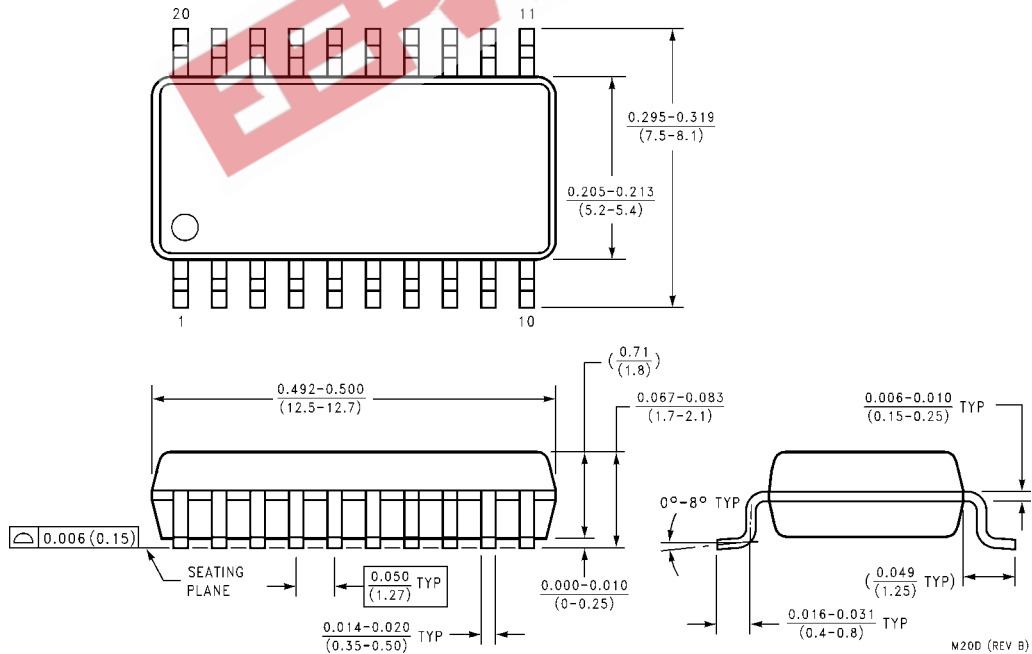
### Parallel Expansion



**Physical Dimensions** inches (millimeters) unless otherwise noted



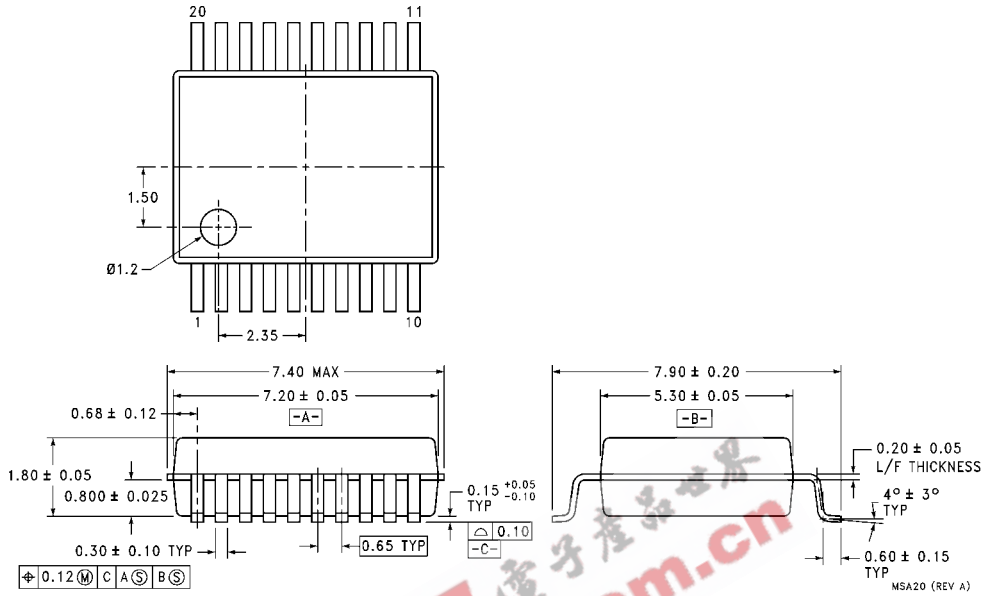
**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide Package Number M20B**



**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide Package Number M20D**

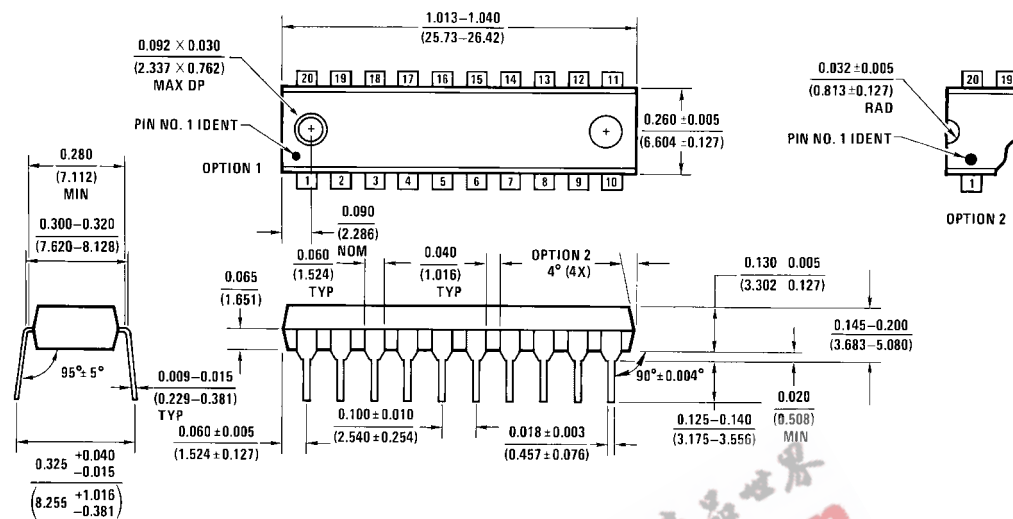
74F521

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



**20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide  
Package Number MSA20**

### Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide  
Package Number N20A

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